

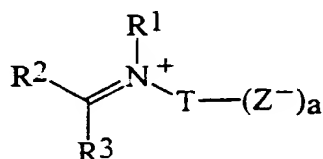
## WHAT IS CLAIMED IS:

- 5 *[Handwritten signature]*
1. A detergent composition comprising a detergent ingredient, a pectate lyase enzyme and bleach system selected from the group consisting of a metal bleach catalyst; a combination of a peroxygen source and a bleach booster selected from the group consisting of zwitterionic imines, anionic imine polyions having a net negative charge of from -1 to -3, and/or mixtures thereof; a diacyl peroxide and/or mixtures thereof.
  - 10 2. A detergent composition according to claim 1 wherein the metal bleach catalyst is selected from :  
(a) the  $[Mn(Bcyclam)Cl_2]$  catalyst;  
(b) the cobalt catalyst having the formula :  $Co[(NH_3)_n M_m B_b T_t Q_q P_p] Y_y$  wherein Cobalt is in the +3 oxidation from, n is an integer from 0 to 5, preferably 4-5, more preferably 5; M represents a monodentate ligand; m is an integer from 0-5, preferably 1 or 2, more preferably 1; B represents a bidentate ligand; b is an integer from 0-2; T represents a tridentate ligand; t is 0 or 1; Q is a tetradentate ligand; q is 0 or 1; P is an pentadentate ligand; p is 0 or 1 and  $n+m+2b+3t+4q+5p=6$ ; Y is one or more appropriately selected counteranions present in a number y, where y is an integer from 1-3, preferably 2-3, more preferably 2 when Y is a -1 charged anion, to obtain a charge-balanced salt;  
(c) the cobalt catalyst having the formula  $[Co(NH_3)_5 M] T_y$  wherein cobalt is in the +3 oxidation state; M is a carboxylate-containing ligand having the formula  $RC(O)O^-$ ; and T is one or more counteranions present in a number y, where y is an integer to obtain a charge-balanced salt (preferably from 1-3, more preferably 2 when T is a -1 charged anion); and/or mixtures thereof.
  - 30 3. A detergent composition according to 1-2 comprising said metal bleach catalyst and further comprising a peroxygen source, preferably selected from the group consisting of a hydrogen peroxide source, a peroxyacid bleach precursor compound, and/or mixtures thereof.

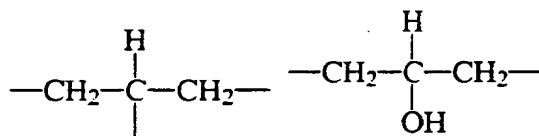
4. A composition according to claims 2-3 wherein the metal bleach catalyst is present in an amount of from 1ppb to 10%, preferably from 0.1ppm to 1%, more preferably from 1ppm to 0.1% by weight of total composition.
5. A detergent composition according to any of the preceding claims wherein said diacyl peroxide is selected from the group consisting of dibenzoyl peroxide, benzoyl glutaryl peroxide, benzoyl succinyl peroxide, di(2-methyl benzoyl) peroxide, and/or mixtures thereof.
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6. A detergent composition according to claim 5 wherein said diacyl peroxide is dibenzoyl peroxide.
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7. A detergent composition according to any of the preceding claims wherein said diacyl peroxide is comprised in a particle; said particle comprising from 1-80% by weight of said particle of diacyl peroxide, from 0.01-95% by weight of said particle of a water soluble stabilising additive.
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8. A detergent composition according to claim 7 wherein said stabilising additive is selected from the group consisting of alkali metal sulfates and citrates, ethoxylated C16-20 alcohols, polyethylene glycols melting above 100°F, maltodextrins, polyacrylate polymers and copolymers of molecular weight between 1.000 and 80.000, ethylene diamine tetra-acetates, ethylene diamine disuccinates and/or mixtures thereof.
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9. A detergent composition according to claim 1-4 wherein said diacyl peroxide is dilauroyl peroxide.
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10. A detergent composition according to any of the preceding claims wherein said diacyl peroxide is comprised at a level of from 0.01% to 20% by weight of the composition, preferably 0.5% to 10%, more preferably 0.2% to 3%.
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11. A detergent composition according to claims 7-10 wherein the diacyl peroxide is incorporated into a particulate and said particle is comprised at a level of from 0.1% to 30%, preferably from 1% to 15%, more preferably from 1.5% to 10% of the total composition.

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TOTAL 558889

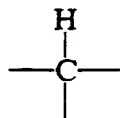
12. A detergent composition according to any of the preceding claims wherein said bleach booster is selected from the group consisting of aryliminium zwitterions, aryliminium polyions having a net negative charge of from -1 to -3; and/or mixtures thereof.
13. A detergent composition according to claim 12 wherein said bleach booster has the formula:



wherein R<sup>1</sup>-R<sup>3</sup> are moieties having a total charge of from about 0 to about -1; R<sup>1</sup> and R<sup>2</sup> form part of a common ring; T is selected from the group consisting of: -(CH<sub>2</sub>)<sub>b</sub>- wherein b is from about 1 to about 8, -(CH(R<sup>5</sup>))- wherein R<sup>5</sup> is C<sub>1</sub>-C<sub>8</sub> alkyl, -CH<sub>2</sub>(C<sub>6</sub>H<sub>4</sub>)-,

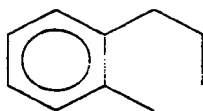


and -(CH<sub>2</sub>)<sub>d</sub>(E)(CH<sub>2</sub>)<sub>f</sub> wherein d is from 2 to 8, f is from 1 to 3 and E is -C(O)O-, -C(O)NR<sup>6</sup> or :



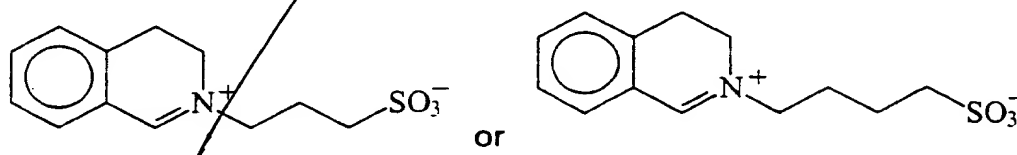
- wherein R<sup>6</sup> is H or C<sub>1</sub>-C<sub>4</sub> alkyl; Z is covalently bonded to T and Z is selected from the group consisting of -CO<sub>2</sub><sup>-</sup>, -SO<sub>3</sub><sup>-</sup> and -OSO<sub>3</sub><sup>-</sup> and a is either 1 or 2.

14. A detergent composition according to claims 12-13 wherein R<sup>1</sup> and R<sup>2</sup> together form the non-charged moiety:

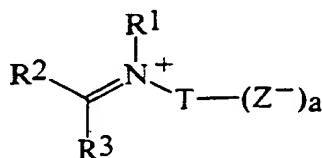


15. A detergent composition according to claims 12-14 wherein said bleach booster is an aryliminium zwitterion and  $R^3$  is H, T is  $-(CH_2)_b-$  or  $-CH_2(C_6H_4)-$ , Z is  $-SO_3^-$ , a is 1 and b is from 2 to 4.

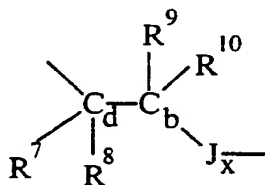
16. A detergent composition according to claims 12-15 wherein said bleach booster is an aryliminium zwitterion having the formula:



17. A detergent composition according to claim 12 wherein said bleach booster has the following formula:



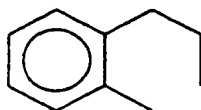
wherein  $R^1 - R^3$  is hydrogen or an unsubstituted or substituted radical selected from the group consisting of phenyl, aryl, heterocyclic ring, alkyl and cycloalkyl radicals;  $R^1$  and  $R^2$  form part of a common ring; T has the formula:



wherein x is equal to 0 or 1; J, when present, is selected from the group consisting of  $-CR^{11}R^{12}$ ,  $-CR^{11}R^{12}CR^{13}R^{14}$ , and  $-CR^{11}R^{12}CR^{13}R^{14}CR^{15}R^{16}$ ;  $R^7-R^{16}$  are selected from the group consisting of H, linear or branched  $C_1-C_{18}$  substituted or unsubstituted

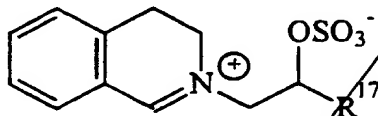
alkyl, alkylene, oxyalkylene, aryl, substituted aryl, substituted arylcarbonyl groups, and amide groups; provided that at least one of  $R^7$ - $R^8$  must be H or methyl, and that when neither  $R^9$  nor  $R^{10}$  is H, one of  $R^7$ - $R^8$  must be H; Z is covalently bonded to  $J_x$  when x is 1 and to  $C_b$  when x is 0; and Z is selected from the group consisting of  $-CO_2^-$ ,  $-SO_3^-$  and  $-OSO_3^-$ , and a is 1.

18. A detergent composition according to claim 17 wherein said bleach booster wherein  $R_1$  and  $R_2$  are defined in its formula as  $R_1$  and  $R_2$  together form the non-charged moiety:



19. A detergent composition according to claims 17-18 wherein said bleach booster is an aryliminium zwitterion and  $R^3$  is H, Z is  $-OSO_3^-$ , a is 1.

20. A detergent composition according to claims 17-19 wherein said bleach booster is an aryliminium zwitterion having the formula:



where  $R^{17}$  is selected from the group consisting of H and linear or branched  $C_1$ - $C_{18}$  substituted or unsubstituted alkyl.

21. A detergent composition according to any of the preceding claims wherein said bleach booster is comprised at a level of from 0.01% to 10% by weight of the total composition.

22. A detergent composition according to claims 12-21 wherein said peroxygen source is comprised at a level of from 0.01% to 60% by weight of the total composition.

23. A detergent composition according to claims 12-22 wherein said peroxygen source comprises a preformed peracid compound selected from the group

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consisting of percarboxylic acids and salts, percarbonic acids and salts, perimidic acids and salts, peroxymonosulfuric acids and salts, and/or mixtures thereof; a hydrogen peroxide source, a bleach activator and/or mixtures thereof.

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24. A detergent composition according to claim 23 wherein said hydrogen peroxide source is selected from the group consisting of perborate compounds, percarbonate compounds, perphosphate compounds and/or mixtures thereof.

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25. A detergent composition according to claim 23 wherein said bleach activator is selected from the group consisting of tetraacetylenediamine, sodium decanoyloxybenzene sulfonate, sodium nonanoyloxybenzene sulfonate, sodium octanoyloxybenzene sulfonate, (6-octanamido-caproyl)oxybenzenesulfonate, (6-nonanamido-caproyl)oxybenzenesulfonate, (6-decanamido-caproyl)oxybenzenesulfonate, and/or mixtures thereof.

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26. A detergent composition according to any of the preceding claims wherein said pectate lyase is present at a level of from 0.0001% to 2%, preferably from 0.0005% to 1.0, more preferably from 0.001% to 0.5% pure enzyme by weight of total composition.

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27. A detergent composition according to any of the preceding claims further comprising a pectin lyase.

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28. Use of a composition according to any of the preceding claims for the removal of plant-, dirt-based stains, highly coloured food soils/stains and body soils.

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29. Use of a composition according to any of the preceding claims for superior fabric whiteness maintenance.
30. Use of a composition according to claims 5-11 for effective highly coloured stains and soils removal on plasticware, and/or for preventing the staining and/or discolouration of the dishware by highly coloured components.

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